

CLAIMS

What is claimed is:

- 1 1. A system, comprising:
2 a spontaneous data communication network having:
3 a set of mobile units, wherein each mobile unit in the set of mobile
4 units includes a router to transmit and receive data packets from any other mobile
5 unit in the set of mobile units, wherein at least one mobile unit includes an
6 antenna in a light.
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- 1 2. The system of claim 1, wherein each router is a home router to store and
2 adjust home potentials of the home router, to receive and store neighbor potentials
3 of neighboring routers, to determine ideal data packet flows using the home and
4 neighbor potentials with an optimization of at least one of a merit function or a
5 penalty function involving stochastic changes in topology in the spontaneous data
6 communication network, and to receive and route data packets based on the home
7 and neighbor potentials.
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- 1 3. The system of claim 1, wherein each router implements at least one of an
2 Open Shortest Path First (OSPF), Border Gateway Protocol (BGP), Routing
3 Information Protocol (RIP), or Transport Control Protocol/Internet Protocol
4 (TCP/IP).
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- 1 4. The system of claim 1, further comprising a set of stationary units, wherein
2 each stationary unit in the set of stationary units includes a router to transmit and
3 receive data packets from any other stationary unit in the set of stationary units or
4 any other mobile unit.
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1 5. The system of claim 4, wherein each antenna transmits and receives data
2 on at least one of an optical carrier, a radio frequency (RF) carrier, a microwave
3 carrier, or an infrared (IR) carrier via free space.

1 6. The system of claim 5, wherein each router implements at least one of an
2 Open Shortest Path First (OSPF), Border Gateway Protocol (BGP), Routing
3 Information Protocol (RIP), or Transport Control Protocol/Internet Protocol
4 (TCP/IP).

1 7. A system, comprising:

2 a spontaneous data communication network having:

3 a set of stationary units, wherein each stationary unit in the set of
4 stationary units includes a router to transmit and receive data packets from any
5 other stationary unit in the set of stationary units, wherein each router is a home
6 router to store and adjust home potentials of the home router, to receive and store
7 neighbor potentials of neighboring routers, to determine ideal data packet flows
8 using the home and neighbor potentials with an optimization of at least one of a
9 merit function or a penalty function involving stochastic changes in topology in
10 the spontaneous data communication network, and to receive and route data
11 packets based on the home and neighbor potentials.

1 8. The system of claim 7, wherein each router implements at least one of an
2 Open Shortest Path First (OSPF), Border Gateway Protocol (BGP), Routing
3 Information Protocol (RIP), or Transport Control Protocol/Internet Protocol
4 (TCP/IP).

1 9. The system of claim 7, wherein at least one stationary unit in the set of
2 stationary units includes furniture.

1 10. The system of claim 7, wherein at least one stationary unit in the set of
2 stationary units includes equipment.

1 11. An apparatus, comprising:
2 a vehicle having:
3 an antenna located in a headlight or a taillight; and
4 a transceiver coupled to the antenna, the transceiver having a router to
5 transmit and receive data packets.

1 12. The system of claim 11, wherein each router is a home router to store and
2 adjust home potentials of the home router, to receive and store neighbor potentials
3 of neighboring routers, to determine ideal data packet flows using the home and
4 neighbor potentials with an optimization of at least one of a merit function or a
5 penalty function involving stochastic changes in topology in the spontaneous data
6 communication network, and to receive and route data packets based on the home
7 and neighbor potentials.

1 13. The system of claim 7, wherein each router implements at least one of an
2 Open Shortest Path First (OSPF), Border Gateway Protocol (BGP), Routing
3 Information Protocol (RIP), or Transport Control Protocol/Internet Protocol
4 (TCP/IP).

1 14. An apparatus, comprising:

2 a stationary unit having:

3 an antenna; and

4 a transceiver coupled to the antenna having a router to store and
5 adjust its potentials, to receive and store a secondary set of potentials of routers in
6 a secondary set of routers, to determine ideal data packet flows using the
7 potentials with an optimization of at least one of a merit function or a penalty
8 function involving stochastic changes in topology in a spontaneous data
9 communication network, and to receive and route data packets based on the
10 potentials.

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1 15. The apparatus of claim 14, wherein the stationary unit is at least one of a
2 piece of furniture or equipment.

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1 16. The apparatus of claim 15, wherein the stationary unit is at least one of a
2 road sign, an overpass, a bridge, a stoplight, a computer, a desk, a credenza, a
3 cabinet, a telephone, a chair, a printer, a copier, a lamp, a light fixture, a
4 thermostat, a computer, an architectural structure, a milling machine, a lathe, a
5 drill press, a tool, a toolbox, a parts washer, a forklift, or a workbench.

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1 17. The apparatus of claim 14, wherein each antenna transmits and receives
2 data on at least one of an optical carrier, a radio frequency (RF) carrier, a
3 microwave carrier, or an infrared (IR) carrier via free space.

1 18. A method, comprising:
2 transmitting data packets into free space from an antenna in at least one of
3 a first vehicle headlight or taillight;
4 routing the data packets to at least one of a second vehicle headlight or
5 taillight, a road sign, an overpass, a bridge, a stoplight, or a building; and
6 receiving the data packets from free space at an antenna in at least one of
7 the second vehicle headlight or taillight, the road sign, an overpass, a bridge, a
8 stoplight, or a building.

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1 19. The method of claim 18, wherein transmitting data packets into free space
2 from an antenna in at least one of a first vehicle headlight or taillight and
3 receiving the data packets from free space at an antenna in at least one of the
4 second vehicle headlight or taillight, the road sign, an overpass, a bridge, a
5 stoplight, or a building comprises transmitting and receiving data packets on at
6 least one of an optical carrier, a radio frequency (RF) carrier, a microwave carrier,
7 or an infrared (IR) carrier via free space.

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1 20. The method of claim 18, wherein routing the data packets to at least one of
2 a second vehicle headlight or taillight, a road sign, an overpass, a bridge, a
3 stoplight, or a building comprises at least one of receiving, storing, or adjusting
4 potentials to determine ideal data packet flows with an optimization of a merit
5 function or a penalty function involving stochastic changes in topology in a
6 spontaneous data communication network, and routing data packets based on the
7 potentials.

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1 21. The method of claim 20, wherein routing the data packets to at least one of
2 a second vehicle headlight or taillight, a road sign, an overpass, a bridge, a
3 stoplight, or a building comprises implementing at least one of an Open Shortest
4 Path First (OSPF), Border Gateway Protocol (BGP), Routing Information
5 Protocol (RIP), or Transport Control Protocol/Internet Protocol (TCP/IP).

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1 22. A system, comprising:

2 a spontaneous data communication network having:

3 a set of mobile units, wherein each mobile unit in the set of mobile
4 units includes a router to transmit and receive data packets from any other mobile
5 unit in the set of mobile units, wherein each router is a home router to store and
6 adjust home potentials of the home router, to receive and store neighbor potentials
7 of neighboring routers, to determine ideal data packet flows using the home and
8 neighbor potentials with an optimization of at least one of a merit function or a
9 penalty function involving stochastic changes in topology in the spontaneous data
10 communication network, and to receive and route data packets based on the home
11 and neighbor potentials.

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1 23. The system of claim 22, wherein at least one mobile unit in the set of
2 mobile units includes a bus, an automobile, a bicycle, a motorcycle, a train, a
3 trolley, a ferry, or a truck.

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